	L #	Hits	Search Text	DBs	Time Stamp
1	L1	61324	rta rtp rto anneal annealing annealed anneals annealling annealled	USPAT	2001/03/14 15:18
2	L2	6357	1 near10 (oxide dielectric insulator insulating insulation)	USPAT	2001/03/14 13:59
3	L3	785	2 and (infrared infra-red ir)	USPAT	2001/03/14 15:23
4	L4	123	2 and ((mercury Hg xenon Xe) near4 lamp)	USPAT	2001/03/14 14:02
5	L5	865	3 4	USPAT; EPO; JPO	2001/03/14 14:04
6	L9	110	5 and ((interface surface) near3 state)	USPAT	2001/03/14 15:22
7	L10	24	9 and @rlad<19930825	USPAT	2001/03/14 15:22
8	L11	36	9 and @ad<19930825	USPAT	2001/03/14 15:22
9	L12	33	9 and @prad<19930825	USPAT	2001/03/14 15:22
10	L13	60	10 11 12	USPAT	2001/03/14 14:08
11	L14	4591	1 near25 (oxygen "O.sub.2" ozone "O.sub.3" oxidizing)	USPAT	2001/03/14 15:19
12	L15	203	1 near25 (("n.sub.2" adj O) or (nitrous adj oxide))	USPAT	2001/03/14 15:20
13	L16	6146	1 near25 (NO or (nitric adj oxide))	USPAT	2001/03/14 15:21
14	L17	9674	14 15 16	USPAT	2001/03/14 15:21
15	L18	638	17 and ((interface interfacial surface) near3 state)	USPAT	2001/03/14 15:23
16	L19	174	18 and @rlad<19930825	USPAT	2001/03/14 15:23
17	L20	264	18 and @ad<19930825	USPAT	2001/03/14 15:23
18	L21	228	18 and @prad<19930825	USPAT	2001/03/14 15:23
19	L22	395	19 20 21	USPAT	2001/03/14 15:23
20	L23	71	22 and (infrared infra-red ir)	USPAT	2001/03/14 15:54
21	L24	46	22 and (pinhole densify densified densifying)	USPAT	2001/03/14 15:55
22	L25	6	22 and (densifies)	USPAT	2001/03/14 15:55
23	L26	46	24 25	USPAT	2001/03/14 15:56
24	L27	35	26 and ($3cvd)	USPAT	2001/03/14 15:56

```
Set     Items   Description
S1         24   (ANNEAL?(10N)(OXYGEN OR OXIDIZING OR NITROUS OR NITRIC)) A-
               ND (((INTERFACE OR SURFACE)(3N)(STATE?)) OR TRAP?) AND (PECVD
               OR CVD OR LPCVD) AND (SILICON(W)(OXIDE OR DIOXIDE))
S2          0   S1 AND (PD=<1994 OR PD<19930825)
S3         16   RD S1 (unique items)
?t s3/full/all
```

3/19/1 (Item 1 from file: 2)

DIALOG(R)File 2:INSPEC

6731278 INSPEC Abstract Number: A2000-22-7340Q-009, B2000-11-2530F-029

Title: Si-TiO/sub 2/ interface evolution at prolonged annealing in low vacuum or N/sub 2/O ambient

Author(s): Erkov, V.G.; Devyatova, S.F.; Molodstova, E.L.; Malsteva, T.V. ; Yanovskii, U.A.

Author Affiliation: Inst. of Semicond. Phys., Novosibirsk, Russia

Journal: Applied Surface Science Conference Title: Appl. Surf. Sci. (Netherlands) vol.166 p.51-6

Publisher: Elsevier,

Publication Date: 9 Oct. 2000 Country of Publication: Netherlands

CODEN: ASUSEE ISSN: 0169-4332

SICI: 0169-4332(20001009)166L.51:TIEP;1-R

Material Identity Number: I974-2000-019

U.S. Copyright Clearance Center Code: 0169-4332/2000/$20.00

Conference Title: Seventh International Conference on the Formation of Semiconductor Interfaces

Conference Date: 21-25 June 1999 Conference Location: Goteborg, Sweden

Document Number: S0169-4332(00)00415-3

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Experimental (X)

Abstract: Titanium dioxide layers were obtained by the low-pressure chemical vapour deposition (**LPCVD**) method from a TiCl/sub 4/, H/sub 2/ and N/sub 2/O mixture at 630 degrees C and had rutile modification. The dielectric constant of the titanium dioxide is high, approximately 110, and the breakdown electric field strength more than 1 MV/cm. The fixed charge for the Si-TiO/sub 2/ structures is negative and has a value in the order of 5*10/sup -8/ C cm/sup -2/ and the **interface state** density of these structures is 6*10/sup 10/ eV/sup -1/ cm/sup -2/. After **annealing** in **oxidizing** ambient, the dielectric constant is found to fall off, and the **interface** density of **states** of the Si-TiO/sub 2/ structures is increased. It is proposed that this is connected with the Si-TiO/sub 2/ interface evolution by the formation of a superthin **silicon dioxide** layer. (16 Refs)

Subfile: A B

Descriptors: annealing; **CVD** coatings; electric breakdown; electronic density of states; **interface states** ; permittivity; semiconductor-insulator boundaries; silicon; titanium compounds

Identifiers: Si-TiO/sub 2/ interface evolution; prolonged annealing; low vacuum; N/sub 2/O ambient; low-pressure chemical vapour deposition; **LPCVD** ; rutile modification; dielectric constant; breakdown electric field strength; fixed charge; **interface state** density; oxidizing ambient; **interface** density of **states** ; superthin **silicon dioxide** layer; 630 degC; N/sub 2/O; Si-TiO/sub 2

Class Codes: A7340Q (Electrical properties of metal-insulator-semiconductor structures); A7720 (Dielectric permittivity) ; A5280 (Electric discharges); A7750 (Dielectric breakdown and space-charge effects); A7320A (Surface states, band structure, electron density of states); A6170A (Annealing processes); B2530F (Metal-insulator-semiconductor structures); B2810D (Dielectric breakdown and discharges); B2550A (Annealing processes in semiconductor technology)

Chemical Indexing:

N2O bin - N2 bin - N bin - O bin (Elements - 2)

Si-TiO2 int - TiO2 int - O2 int - Si int - Ti int - O int - TiO2 bin - O2

bin - Ti bin - O bin - [redacted]el (Elements - 1,2,3)
Numerical Indexing: temperature 9.03E+02 K

3/19/2 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

5858499 INSPEC Abstract Number: B9804-2560R-061
Title: Back-surface passivation of polycrystalline CdSe thin-film transistors
Author(s): Landheer, D.; Masson, D.P.; Belkouch, S.; Das, S.R.; Quance, T.; LeBrun, L.; Hulse, J.E.
Author Affiliation: Inst. for Microstruct. Sci., Nat. Res. Council of Canada, Ottawa, Ont., Canada
Journal: Journal of Vacuum Science & Technology A (Vacuum, Surfaces, and Films) Conference Title: J. Vac. Sci. Technol. A, Vac. Surf. Films (USA) vol.16, no.2 p.834-7
Publisher: AIP for American Vacuum Soc,
Publication Date: March-April 1998 Country of Publication: USA
CODEN: JVTAD6 ISSN: 0734-2101
SICI: 0734-2101(199803/04)16:2L.834:BSPP;1-O
Material Identity Number: D746-98002
U.S. Copyright Clearance Center Code: 0734-2101/98/16(2)/834/4/$10.00
Conference Title: Eighth Canadian Semiconductor Technology Conference
Conference Date: 12-15 Aug. 1997 Conference Location: Ottawa, Ont., Canada
Document Number: S0734-2101(98)04202-X
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
Abstract: The electrical characteristics of simple inverted-gate CdSe thin-film transistors (TFTs) were monitored after annealing and back-surface passivation treatments and the results were correlated with chemical analysis of the back interface. A dramatic increase in TFT current was observed after a short vacuum anneal at 320 degrees C. X-ray photoelectron spectroscopy (XPS) analysis showed that the vacuum anneal removed part of the oxide bonded to Se from the back (top) surface. This was confirmed by temperature-programed desorption data for oxidized CdSe, which showed two distinct selenium oxide species desorbing above 300 degrees C. XPS analysis showed that evaporated SiO, or SiO/sub 2/ deposited by microwave plasma-enhanced chemical-vapor deposition, reacted strongly with an oxidized CdSe surface by removing the Se-bound **oxygen** present after an air **anneal** . Changes in the width of the Cd 3d/sub 5/2/ peak suggested that the Cd bound oxygen was also transferred to the SiO during the deposition of the oxide. A reoxidation of the CdSe/SiO interface occurred after annealing in air at 350 degrees C. In contrast, **silicon dioxide** deposited by e-beam evaporation did not react as strongly with the native oxide. The interfacial oxide was reduced by annealing in forming gas. A reduced CdSe surface with no Se bonded to oxygen and a narrow Cd 3d/sub 5/2/ XPS peak was associated with a high density of donors at the interface. (9 Refs)
Subfile: B
Descriptors: annealing; cadmium compounds; electron beam deposition; II-VI semiconductors; impurity states; **interface states** ; interface structure; oxidation; passivation; plasma **CVD** ; silicon compounds; thermally stimulated desorption; thin film transistors; X-ray photoelectron spectra
Identifiers: back-surface passivation; polycrystalline CdSe thin-film transistors; electrical characteristics; inverted-gate CdSe thin-film transistors; TFTs; annealing; back-surface passivation treatments; chemical analysis; TFT current; short vacuum annealing; X-ray photoelectron spectroscopy; XPS; oxide; temperature-programed desorption; oxidized CdSe; selenium oxide; microwave plasma-enhanced chemical-vapor deposition; Se-bound oxygen; reoxidation; CdSe/SiO interface; e-beam evaporation; interfacial oxide; donors; 300 to 350 C; CdSe-SiO/sub 2/

Class Codes: B2560R ([redacted]ulated gate field effect trans[redacted]ors); B2550E (Surface treatment for semiconductor devices); B2550A (Annealing processes for semiconductor devices); B0520F (Vapour deposition)
Chemical Indexing:
CdSe-SiO2 int - CdSe int - SiO2 int - Cd int - O2 int - Se int - Si int - O int - CdSe bin - SiO2 bin - Cd bin - O2 bin - Se bin - Si bin - O bin (Elements - 2,2,4)
Numerical Indexing: temperature 5.73E+02 to 6.23E+02 K

Refs might have something

3/19/3 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC

5035531 INSPEC Abstract Number: A9519-8115H-025
Title: Defects generated by Fowler-Nordheim injection in silicon dioxide films produced by plasma-enhanced chemical-vapour deposition with nitrous oxide and silane
Author(s): Landheer, D.; Tao, Y.; Xu, D.-X.; Sproule, G.I.; Buchanan, D.A.
Author Affiliation: Inst. for Microstructural Sci., Nat. Res. Council of Canada, Ottawa, Ont., Canada
Journal: Journal of Applied Physics vol.78, no.3 p.1818-23
Publication Date: 1 Aug. 1995 Country of Publication: USA
CODEN: JAPIAU ISSN: 0021-8979
U.S. Copyright Clearance Center Code: 0021-8979/95/78(3)/1818/6/$6.00
Language: English Document Type: Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
Abstract: High quality **silicon dioxide** films have been produced using a direct plasma-enhanced chemical vapour deposition process with silane, nitrous oxide and helium that leaves a nitrided layer at the Si-SiO/sub 2/ interface. X-ray photoelectron spectroscopy coupled with etch-back of the films has shown that the interface nitrogen is incorporated by nitridation of the silicon surface. Fowler-Nordheim injection measurements on thin films annealed after deposition for 1 minute at 950 degrees C show that the neutral-**trap** generation and **interface state** generation rates are comparable to that of thermal oxide if a proper deposition power is chosen. The data is consistent with an interpretation in which fast donor states, not P/sub b/ centres, account for almost all of the increase in the charge **trapped** at the interface. Too high deposition powers lead to excessive nitrogen and higher **interface state** generation rates. It is proposed that improved performance under hot-electron stress could be obtained by using an optimal deposition power to obtain an optimal nitrogen concentration followed by **annealing** in **oxygen** . (32 Refs)
Subfile: A
Descriptors: crystal defects; defect states; insulating thin films; **interface states** ; plasma **CVD** coatings; silicon compounds; X-ray photoelectron spectra
Identifiers: Fowler-Nordheim injection; plasma-enhanced chemical-vapour deposition; Si-SiO/sub 2/ interface; X-ray photoelectron spectroscopy; etch-back; interface nitrogen; annealed; neutral-**trap** generation; **interface state** generation rates; fast donor states; hot-electron stress ; 1 min; 950 C; SiO/sub 2
Class Codes: A8115H (Chemical vapour deposition); A7360H (Electronic properties of insulating thin films); A6855 (Thin film growth, structure, and epitaxy); A7960E (Photoelectron spectra of semiconductors and insulators); A7865J (Optical properties of nonmetallic thin films); A7320H (Surface impurity and defect levels; energy levels of adsorbed species); A6860 (Physical properties of thin films, nonelectronic)
Chemical Indexing:
SiO2 int - O2 int - Si int - O int - SiO2 bin - O2 bin - Si bin - O bin (Elements - 2)
Numerical Indexing: time 6.0E+01 s; temperature 1.22E+03 K

3/19/4 (Item 4 from file: 2)
DIALOG(R)File 2:INSPEC
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4661956 INSPEC Abstract Number: A9411-7340Q-012, B9406-2530F-024
Title: The effects of gamma irradiation on low-pressure chemical-vapor-deposited silicon dioxide **metal-oxide-silicon structures**
Author(s): Ang, S.S.; Shi, Y.J.; Brown, W.D.; West, L.
Author Affiliation: Dept. of Electr. Eng., Arkansas Univ., Fayetteville, AR, USA
Journal: Microelectronics and Reliability vol.34, no.5 p.909-19
Publication Date: May 1994 Country of Publication: UK
CODEN: MCRLAS ISSN: 0026-2714
U.S. Copyright Clearance Center Code: 0026-2714/94/$6.00+.00
Language: English Document Type: Journal Paper (JP)
Treatment: Experimental (X)
Abstract: The effects of gamma irradiation on as-deposited, **oxygen -annealed** , and dual-dielectric gate (undoped polysilicon/oxide) low-pressure chemical-vapor-deposited (**LPCVD**) **silicon dioxide** (SiO/sub 2/) metal-oxide-silicon (MOS) structures were investigated. As-deposited **LPCVD** SiO/sub 2/ MOS structures exhibit the largest shift in flatband voltage with gamma irradiation. This is most likely due to the large number of bulk oxide **traps** resulting from the nonstochiometric nature of as deposited **LPCVD** SiO/sub 2/. Dual-dielectric (undoped polysilicon/annealed **LPCVD** SiO/sub 2/) MOS structures exhibit the smallest shift in flatband voltage and increase in **interface state** density compared to as-deposited and **oxygen -annealed LPCVD** SiO/sub 2/ MOS structures. The **interface state** density of dual-dielectric MOS structures increases from 5*10/sup 10/ eV cm/sup -2/ to 2-3*10/sup 11/ eV cm/sup -2/ after irradiation to a gamma total dose level of 1 Mrads(Si). This result suggests that the recombination of atomic hydrogen atoms with silicon dangling bonds, either along grain boundaries or in crystallites of the undoped polysilicon layer in dual-dielectric (undoped polysilicon/annealed **LPCVD** SiO/sub 2/) MOS structures, probably reduces the number of atomic hydrogen atoms reaching the Si/SiO/sub 2/ **interface** to generate **interface states** . (23 Refs)
Subfile: A B
Descriptors: annealing; capacitance; **CVD** coatings; dangling bonds; gamma-ray effects; **interface** electron **states** ; metal-insulator-semiconductor structures; silicon compounds
Identifiers: gamma irradiation; **LPCVD** SiO/sub 2/ MOS structures; **oxygen -annealing** ; dual-dielectric MOS structures; flatband voltage shift ; bulk oxide **traps** ; nonstochiometric nature; undoped polysilicon; **interface state** density; gamma total dose level; dangling bonds; atomic H atom recombination; grain boundaries; crystallites; C-V characteristics; 1 Mrad; Si-SiO/sub 2
Class Codes: A7340Q (Metal-insulator-semiconductor structures); A6180E (Gamma rays); A7320H (Impurity and defect levels; energy levels of adsorbed species); A6170A (Annealing processes); B2530F (Metal-insulator-semiconductor structures)
Chemical Indexing:
Si-SiO2 int - SiO2 int - O2 int - Si int - O int - SiO2 bin - O2 bin - Si bin - O bin - Si el (Elements - 1,2,2)
Numerical Indexing: radiation absorbed dose 1.0E+04 Gy

3/19/5 (Item 5 from file: 2)
DIALOG(R)File 2:INSPEC
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4414697 INSPEC Abstract Number: A9313-7340Q-004
Title: Electrical characterization of low-pressure chemical-vapor-deposited silicon dioxide **metal-oxide-silicon structures**
Author(s): Ang, S.S.; Shi, Y.J.; Brown, W.D.
Author Affiliation: Dept. of Electr. Eng., Arkansas Univ., Fayetteville, AR, USA
Journal: Journal of Applied Physics vol.73, no.5 p.2397-401

QC1.J82

Publication Date: 1 M[redacted]h 1993 Country of Publication[redacted]SA
CODEN: JAPIAU ISSN: 0021-8979
U.S. Copyright Clearance Center Code: 0021-8979/93/052397-05$06.00
Language: English Document Type: Journal Paper (JP)
Treatment: Experimental (X)
Abstract: The electrical characteristics of as-deposited and **oxygen - annealed** low-pressure chemical-vapor-deposited (**LPCVD**) **silicon dioxide** (SiO/sub 2/) metal-oxide-silicon (MOS) structures were investigated. As-deposited **LPCVD** SiO/sub 2/ MOS structures exhibit a high oxide fixed charge density in the mid-10/sup 11/ cm/sup -2/ and an **interface state** density in the low-10/sup 11/ cm/sup -2/ eV/sup -1/ due to the large number of oxygen and silicon dangling bonds. A low electron barrier height in these structures (1.2 eV) is presumed to be due to lowering of the barrier by excess silicon microclusters. **Oxygen -annealed LPCVD** SiO/sub 2/ MOS structures exhibit oxide fixed charge and **interface state** densities in the mid-10/sup 10/ cm/sup -2/ and mid-10/sup 10/ cm/sup -2/ eV/sup -1/, respectively. Both the as-deposited and annealed devices exhibit turnaround in flatband voltage shift with avalanche electron injection. However, the direction of shift is opposite for the two devices with the annealed device being very similar to that of thermally grown SiO/sub 2/ MOS structures. Apparently, **oxygen annealing** restructures and oxidizes the partial SiO/sub x/ in the as-deposited **LPCVD** oxide into stoichiometric SiO/sub 2/. However, the residual nonstoichiometric SiO/sub 2/ microclusters in the bulk result in an electron barrier height of only 2.3 eV. (24 Refs)
Subfile: A
Descriptors: annealing; **CVD** coatings; dangling bonds; **interface** electron **states** ; metal-insulator-semiconductor structures; silicon; silicon compounds
Identifiers: electrical characteristics; low-pressure chemical-vapor-deposited; MOS structures; fixed charge density; **interface state** density; dangling bonds; annealed devices; flatband voltage shift; avalanche electron injection; stoichiometric; microclusters; SiO/sub 2/-Si
Class Codes: A7340Q (Metal-insulator-semiconductor structures); A7320D (Electron states in low-dimensional structures); A7320H (Impurity and defect levels; energy levels of adsorbed species)
Chemical Indexing:
SiO2-Si int - SiO2 int - O2 int - Si int - O int - SiO2 bin - O2 bin - Si bin - O bin - Si el (Elements - 2,1,2)

3/19/6 (Item 6 from file: 2)
DIALOG(R)File 2:INSPEC

03653723 INSPEC Abstract Number: A90083115, B90043722
Title: The structure and electrical characteristics of oxidized semi-insulating polycrystalline silicon
Author(s): Hseih, B.-C.; Greve, D.W.
Author Affiliation: Dept. of Electr. & Comput. Eng., Carnegie Mellon Univ., Pittsburgh, PA, USA
Journal: Journal of Applied Physics vol.67, no.5 p.2494-500
Publication Date: 1 March 1990 Country of Publication: USA
CODEN: JAPIAU ISSN: 0021-8979
U.S. Copyright Clearance Center Code: 0021-8979/90/052494-07$03.00
Language: English Document Type: Journal Paper (JP)
Treatment: Experimental (X)
Abstract: The influence of an oxidizing ambient on the structure and electrical characteristics of thin films of semi-insulating polysilicon (SIPOS) has been studied. It is shown that SIPOS films 135 nm thick can be completely oxidized to amorphous **silicon dioxide** after 24 h at 600 degrees C in wet **oxygen** . The midgap **interface state** density after oxidation and postmetallization **anneal** is 4*10/sup 10/ cm/sup -2/ eV/sup -1/. The authors also show that this material is suitable for use as a low-temperature deposited gate dielectric for polycrystalline thin-film transistors. (33 Refs)
Subfile: A B

Descriptors: annealing; **CVD** coatings; electronic conduction in insulating thin films; elemental semiconductors; insulating thin films; **interface** electron **states** ; oxidation; semiconductor-insulator boundaries ; silicon; silicon compounds

Identifiers: semiconductor; structure; electrical characteristics; thin films; SIPOS; midgap **interface state** density; oxidation; postmetallization anneal; low-temperature; gate dielectric; thin-film transistors; 600 degC; Si-SiO/sub 2

Class Codes: A7340Q (Metal-insulator-semiconductor structures); A8115H (Chemical vapour deposition); A8160C (Semiconductors); A6855 (Thin film growth, structure, and epitaxy); A7360H (Insulating thin films); A7320D (Electron states in low-dimensional structures); B2530F (Metal-insulator-semiconductor structures); B2520C (Elemental semiconductors); B2550E (Surface treatment and oxide film formation)

Chemical Indexing:

Si-SiO2 int - SiO2 int - O2 int - Si int - O int - SiO2 bin - O2 bin - Si bin - O bin - Si el (Elements - 1,2,2)

Numerical Indexing: temperature 8.73E+02 K

3/19/7 (Item 7 from file: 2)

DIALOG(R)File 2:INSPEC

00981188 INSPEC Abstract Number: A76091178, B76046133

Title: Relationships of the chemical and electrical interfacial properties of germanium-SiO/sub 2/ systems

Author(s): Wang, K.L.; Gray, P.V.

Author Affiliation: Res. & Dev. Center, General Electric Co., Schenectady, NY, USA

Journal: Journal of the Electrochemical Society vol.123, no.9 p. 1392-8

Publication Date: Sept. 1976 Country of Publication: USA

CODEN: JESOAN ISSN: 0013-4651

Language: English Document Type: Journal Paper (JP)

Treatment: Experimental (X)

Abstract: Germanium- **silicon dioxide** structures were prepared by depositing SiO/sub 2/ on cleaned germanium wafers using chemical vapor deposition (**CVD**) from the silane-**oxygen** reaction at 450 degrees C. The structures were then **annealed** in various gas environments, Ar, O/sub 2/, and a 10%-H/sub 2/ and 90%-N/sub 2/ forming gas, at 600 degrees C for 2 hr. For samples annealed in forming gas, the **interface state** density measured by C-V techniques shows a high density near the band edges (10/sup 14//cm/sup 2/-eV). For samples **annealed** in **oxygen** , it decreases to 10/sup 11//cm/sup 2/-eV. High surface recombination velocity was observed in the samples annealed in forming gas. The measured results of charge generation and injection indicated charge losses to the **interface states** but not to oxide **traps** . Profile analyses of the structures were carried out using secondary ion mass spectrometry (SIMS) and Auger electron spectroscopy (AES). (19 Refs)

Subfile: A B

Descriptors: electron **traps** ; elemental semiconductors; germanium; semiconductor-insulator boundaries; silicon compounds; **surface** electron **states**

Identifiers: electrical interfacial properties; annealed; surface recombination velocity; charge generation; injection; charge losses; **interface states** ; oxide **traps** ; secondary ion mass spectrometry; Auger electron spectroscopy; Ge-SiO/sub 2/ structure; chemical vapour deposition; chemical interfacial properties; semiconductor insulator interface

Class Codes: A7320 (Electronic surface states); A7330 (Surface double layers, Schottky barriers, and work functions); A7340Q (Metal-insulator-semiconductor structures); B0510 (Crystal growth); B2530F (Metal-insulator-semiconductor structures); B2550 (Semiconductor device technology)

3/19/8 (Item 1 from file: 8)

DIALOG(R)File 8:Ei Compendex(R)

05690194 E.I. No: EIP00115391308
Title: Si-TiO//2 interface evolution at prolonged annealing in low vacuum or N//2O ambient
Author: Erkov, V.G.; Devyatova, S.F.; Molodstova, E.L.; Malsteva, T.V.; Yanovskii, U.A.
Corporate Source: Siberian Branch, Novosibirsk, Russia
Source: Applied Surface Science v 166 n 1 Oct 2000. p 51-56
Publication Year: 2000
CODEN: ASUSEE ISSN: 0169-4332
Language: English
Document Type: JA; (Journal Article) Treatment: T; (Theoretical); X; (Experimental)
Journal Announcement: 0012W2
Abstract: Titanium dioxide layers were obtained by the low-pressure chemical vapour deposition (**LPCVD**) method from a TiCl//4, H//2 and N//2O mixture at 630 degree C and had rutile modification. The dielectric constant of the titanium dioxide is high, approximately 110, and the breakdown electric field strength more than 1 MV/cm. The fixed charge for the Si-TiO//2 structures is negative and has a value in the order of 5 multiplied by 10** minus **8 C cm** minus **2 and the **interface state** density of these structures is 6 multiplied by 10**1**0 eV** minus **1 cm** minus **2. After **annealing** in **oxidizing** ambient, the dielectric constant is found to fall off, and the **interface** density of **states** of the Si-TiO//2 structures is increased. It is proposed that this is connected with the Si-TiO//2 interface evolution by the formation of a superthin **silicon dioxide** layer. (Author abstract) 16 Refs.
Descriptors: *Semiconducting films; Semiconducting silicon; Titanium dioxide; Chemical vapor deposition; Annealing; Interfaces (materials); Electric breakdown of solids; Thin films; Permittivity; Chemical modification
Identifiers: Low-pressure chemical vapour deposition (**LPCVD**) method
Classification Codes:
712.1.1 (Single Element Semiconducting Materials)
712.1 (Semiconducting Materials); 804.2 (Inorganic Components); 802.2 (Chemical Reactions); 813.1 (Coating Techniques); 537.1 (Heat Treatment Processes)
712 (Electronic & Thermionic Materials); 804 (Chemical Products); 802 (Chemical Apparatus & Plants); 813 (Coatings & Finishes); 537 (Heat Treatment)
71 (ELECTRONICS & COMMUNICATIONS); 80 (CHEMICAL ENGINEERING); 81 (CHEMICAL PROCESS INDUSTRIES); 53 (METALLURGICAL ENGINEERING)

3/19/9 (Item 2 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

05518470 E.I. No: EIP00045112321
Title: Influence of gas desorption from SiOF film prepared by high-density-plasma chemical vapor deposition upon TiN/Ti film
Author: Tamura, Takahiro; Sakai, Junro; Satoh, Makoto
Corporate Source: Rohm Hamamatsu Co Ltd, Shizuoka, Jpn
Source: Japanese Journal of Applied Physics, Part 1: Regular Papers and Short Notes and Review Papers v 38 n 12A Dec 1999. p 6571-6576
Publication Year: 1999
CODEN: JAPNDE ISSN: 0021-4922
Language: English
Document Type: JA; (Journal Article) Treatment: X; (Experimental)
Journal Announcement: 0005W4
Abstract: The influence of gas desorption from fluorine-doped **silicon oxide** (SiOF) film prepared by high density-plasma chemical vapor deposition (**CVD**) upon TiN/Ti film is investigated. In this investigation, two types of SiOF films, containing 14% and 6% fluorine atoms, are compared with regard to gas desorption and diffusion of fluorine, hydrogen and

oxygen atoms into TiN/Ti film on SiOF film, as-deposited TiN/Ti/SiOF film and after 400 degree C annealing. In addition, W film was prepared on TiN/Ti/SiOF film in order to examine the practical effect of gas desorption upon adhesion between Ti film and SiOF film. Thermal desorption mass spectroscopy (TDS) and secondary-ion mass spectroscopy (SIMS) spectral studies clarified the following. (1) SiOF film containing 14% fluorine atoms has a high hydrogen-fluoride content due to moisture absorption after exposure to air, while that containing 6% fluorine atoms does not. (2) During deposition of TiN/Ti film at 200 degree C, many fluorine and hydrogen atoms diffuse from SiOF film containing 14% fluorine atoms and are **trapped** within the Ti film or the Ti/SiOF interface. (3) During 400 degree C annealing, more fluorine atoms diffuse from SiOF film containing 14% fluorine atoms and are also **trapped** within the Ti film. (4) Fluorine atoms **trapped** within the Ti film degrade the adhesion between Ti film and SiOF film. (Author abstract) 36 Refs.

Descriptors: Semiconducting silicon compounds; Desorption; Plasma enhanced chemical vapor deposition; Fluorine; Semiconductor doping; Hydrogen; **Oxygen** ; **Annealing** ; Titanium nitride; Secondary ion mass spectrometry

Identifiers: Gas desorption; Fluorine doped **silicon oxide** ; Thermal desorption mass spectroscopy; High density plasma chemical vapor deposition

Classification Codes:

712.1.2 (Compound Semiconducting Materials)

712.1 (Semiconducting Materials); 802.3 (Chemical Operations); 932.3 (Plasma Physics); 537.1 (Heat Treatment Processes)

712 (Electronic & Thermionic Materials); 802 (Chemical Apparatus & Plants); 932 (High Energy, Nuclear & Plasma Physics); 804 (Chemical Products); 537 (Heat Treatment)

71 (ELECTRONICS & COMMUNICATIONS); 80 (CHEMICAL ENGINEERING); 93 (ENGINEERING PHYSICS); 53 (METALLURGICAL ENGINEERING)

3/19/10 (Item 3 from file: 8)

03081591 E.I. Monthly No: EIM9106-029549

Title: High performance metal/SiO//2/InSb capacitor fabricated by photo-enhanced chemical vapor deposition.

Author: Sun, Tai-Ping; Lee, Si-Chen; Liu, Kou-Chen; Pang, Yen-Ming; Yang, Sheng-Jenn

Corporate Source: Natl Taiwan Univ, Taipei, Taiwan

Conference Title: Physical Concepts of Materials for Novel Optoelectronic Device Applications I: Materials Growth and Characterization

Conference Location: Aachen, Ger Conference Date: 19901028

Sponsor: SPIE

E.I. Conference No.: 14617

Source: Proceedings of SPIE - The International Society for Optical Engineering v 1361 pt 2. Publ by Int Soc for Optical Engineering, Bellingham, WA, USA. p 1033-1037

Publication Year: 1991

CODEN: PSISDG ISSN: 0277-786X

Language: English

Document Type: PA; (Conference Paper) Treatment: X; (Experimental)

Journal Announcement: 9106

Abstract: The high performance AuCr/SiO//2InSb metal-oxide-semiconductor capacitor was fabricated successfully using photo-enhanced chemical vapor deposition. Authors have studied the chemical and electrical properties of photo-SiO//2 oxide on InSb by means of AES analysis and C-V characterization. The low frequency C-V results indicate that high-quality **silicon dioxide** can be deposited at an optimal substrate temperature of 150 degree C by photo-**CVD** . When the MOS device received a high temperature (190 degree C) thermal annealing, the interface charges and the hysteresis behavior of C-V curves are observed to change significantly. Large amount of unsaturated silicon atoms are observed from AES to appear at the SiO//2/native oxide interface whatever the deposition temperature is, whereas **oxygen** atoms pile up at the native oxide/InSb interface after

annealing at 190 degr[redacted]C. The former results in the c[redacted]tion of positive fixed charges, the latter helps to reduce the density of fast **interface states** . (Edited author abstract) 20 Refs.
Descriptors: *CAPACITORS--*Fabrication; SEMICONDUCTOR DEVICES, MOS; SEMICONDUCTING INDIUM COMPOUNDS--Chemical Vapor Deposition; GOLD CHROMIUM ALLOYS; SPECTROSCOPY, AUGER ELECTRON
Identifiers: INDIUM ANTIMONIDE
Classification Codes:
714 (Electronic Components); 712 (Electronic & Thermionic Materials); 802 (Chemical Apparatus & Plants); 547 (Precious & Rare Earth Metals & Alloys); 543 (Chromium, Manganese, Molybdenum, Tantalum, Tungsten, Vanadium & Alloys); 531 (Metallurgy & Metallography)
71 (ELECTRONICS & COMMUNICATIONS); 80 (CHEMICAL ENGINEERING); 54 (METAL GROUPS); 53 (METALLURGICAL ENGINEERING)

3/19/11 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

05196008 Genuine Article#: VG681 Number of References: 14
Title: PARAMAGNETIC DEFECT SPIN CENTERS IN LOW-PRESSURE CHEMICAL-VAPOR-DEPOSITED SILICON- DIOXIDE **FILMS**
Author(s): KAMIGAKI Y; YOKOGAWA K; HASHIMOTO T; UEMURA T
Corporate Source: HITACHI LTD,CENT RES LAB/KOKUBUNJI/TOKYO 185/JAPAN/;
HITACHI LTD,SEMICOND & INTEGRATED CIRCUIT DIV/KODAIRA/TOKYO 187/JAPAN/;
HITACHI ULSI ENGN CORP/KODAIRA/TOKYO 187/JAPAN/
Journal: JOURNAL OF APPLIED PHYSICS, 1996, V80, N6 (SEP 15), P3430-3434
ISSN: 0021-8979
Language: ENGLISH Document Type: ARTICLE
Geographic Location: JAPAN
Subfile: SciSearch; CC PHYS--Current Contents, Physical, Chemical & Earth Sciences
Journal Subject Category: PHYSICS, APPLIED
Abstract: We have found E'-like and amorphous-siliconlike (a-Si-like, . Si=Si-3) spin centers, as well as the well-known E' center (. Si=O-3) in low-pressure chemical-vapor-deposited **silicon -dioxide** (**LPCVD** -SiO2) films, by using the electron-spin-resonance method. The behavior of these paramagnetic defect centers is studied and their origins are considered. An E'-like center is terminated stably by either **oxygen** (O-2) or hydrogen (H-2) gas **annealing** . This E'-like center appears to be an intermediately generated defect but its bonding structure has not yet been identified. The a-Si-like center is terminated stably by high-temperature H-2 gas annealing. The a-Si-like center is thought to exist in the Si clusters in **LPCVD** -SiO2 films. We have also confirmed that the E' center is terminated stably by O-2 gas annealing. As a result, we conclude that both O-2 and H-2 gas annealing are necessary to reduce the quantity of paramagnetic defect centers in **LPCVD** -SiO2 films. (C) 1996 American Institute of Physics.
Identifiers--KeyWords Plus: RESONANCE; A-SIO2; SI
Research Fronts: 94-3280 002 (**INTERFACE STATE** GENERATION MODEL FOR SILICON METAL-OXIDE-SEMICONDUCTOR FIELD-EFFECT TRANSISTORS; MOS DEVICES; HOT-CARRIER DEGRADATION)
Cited References:
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MINAMI S, 1993, V40, P2011, IEEE T ELECTRON DEV
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YAMANAKA T, 1995, V42, P1305, IEEE T ELECTRON DEV
YOKOMICHI H, 1987, V63, P629, SOLID STATE COMMUN

YOUNT JT, 1995, V77 [redacted] 699, J APPL PHYS

3/19/12 (Item 2 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 2001 Inst for Sci Info. All rts. reserv.

00881283 Genuine Article#: FD596 Number of References: 12
Title: METAL-OXIDE SEMICONDUCTOR CHARACTERISTICS OF RAPID THERMAL PROCESSED CHEMICAL VAPOR-DEPOSITED SI02 GATE DIELECTRICS
Author(s): TING W; LI PC; LO GQ; LEE J; KWONG DL
Corporate Source: UNIV TEXAS,DEPT ELECT & COMP ENGN,MICROELECTR RES CTR/AUSTIN//TX/78712
Journal: SOLID-STATE ELECTRONICS, 1991, V34, N4, P385-388
Language: ENGLISH Document Type: ARTICLE
Geographic Location: USA
Subfile: SciSearch; CC PHYS--Current Contents, Physical, Chemical & Earth Sciences; CC ENGI--Current Contents, Engineering, Technology & Applied Sciences
Journal Subject Category: ENGINEERING, ELECTRICAL & ELECTRONIC
Abstract: Current conduction, interfacial integrity, and charge **trapping** characteristics of 200 angstrom rapid thermal nitrided/reoxidized (RTN/RTO) chemical vapor deposited (**CVD**) SiO2 are studied. Results show that RTN reduces the leakage current of **CVD** oxides, contrary to the effects of RTN on thermal oxides. The as-deposited **CVD** oxide after rapid thermal annealing (RTA) in O2 has the lowest electron **trapping** level as compared with the other devices, while devices with RTN/RTO gate dielectrics have superior endurance against constant current stressing. The increased electron **trapping** induced by RTN can be minimized by pre- and post-nitridation **annealing** in **oxygen** .
Identifiers--KeyWords Plus: REOXIDIZED NITRIDED OXIDES; ELECTRICAL CHARACTERISTICS; SIO2-FILMS; BREAKDOWN; SIO2; VLSI
Research Fronts: 89-1736 002 (RADIATION-INDUCED **INTERFACE STATE** GENERATION IN MOS DEVICES; RAPID THERMAL NITRIDED GATE OXIDES; TOTAL-DOSE HARDNESS ASSURANCE ISSUES FOR SOI MOSFETS)
89-3918 001 (TIME-DEPENDENT DIELECTRIC-BREAKDOWN OF CHEMICAL-VAPOR-DEPOSITED SIO2 GATE DIELECTRICS; MOS DEVICES; **SILICON DIOXIDE** FILMS)
Cited References:
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HWANG H, 1989, V55, P755, APPL PHYS LETT
ITO T, 1982, V29, P498, IEEE T ELECTRON DEV
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SHIH DK, 1988, V52, P1698, APPL PHYS LETT
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WU AT, 1989, V10, P443, IEEE ELECTR DEVICE L
YAMABE K, 1985, V32, P423, IEEE T ELECTRON DEV

3/19/13 (Item 3 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
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00702580 Genuine Article#: EP011 Number of References: 10
Title: RADIATION-INDUCED CHARGE TRAPPING IN IMPLANTED BURIED OXIDES
Author(s): BRADY FT; LI SS; KRULL WA
Corporate Source: UNIV FLORIDA,DEPT ELECT ENGN/GAINESVILLE//FL/32611; HARRIS CORP,SEMICOND/MELBOURNE//FL/32901
Journal: JOURNAL OF APPLIED PHYSICS, 1990, V68, N12, P6143-6149
Language: ENGLISH Document Type: ARTICLE
Geographic Location: USA
Subfile: SciSearch; CC PHYS--Current Contents, Physical, Chemical & Earth Sciences

Journal Subject Categor[redacted]PHYSICS, APPLIED
Abstract: We investigate the response of buried oxide layers formed by oxygen implantation to total dose x-ray irradiation. The characterization is based on C-V measurements of the buried oxide capacitor and on back-channel transistor measurements. Reduced charge **trapping** is found for material implanted with a lower **oxygen** dose, **annealed** at higher temperatures, and **annealed** for longer times. Also, total-dose irradiation was found to generate few interface **traps** . A particularly interesting result is that an increase in the concentration of shallow donors with x-ray dose was observed for certain samples. This increase in the donor concentration was observed only in the top Si film.
Identifiers--KeyWords Plus: OXYGEN IMPLANTATION; SILICON; INSULATOR
Research Fronts: 89-0199 001 (PLASMA-ENHANCED CHEMICAL VAPOR-DEPOSITION OF **SILICON DIOXIDE** ; AMORPHOUS SIN FILMS; **LPCVD** NITRIDE PROCESS; DOPED SIO2)
Cited References:
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BRADY FT, 1989, V36, P2187, IEEE T NUCL SCI
CAZCARRA V, 1980, V51, P4206, J APPL PHYS
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WINOKUR PS, 1989, P207, IONIZING RAD EFFECTS

3/19/14 (Item 1 from file: 144)
DIALOG(R)File 144:Pascal

14800382 PASCAL No.: 00-0480965
Si-TiO SUB 2 interface evolution at prolonged annealing in low vacuum or N SUB 2 O ambient
Proceedings of the Seventh International Conference on the Formation of Semiconductor Interfaces, Goeteborg, Sweden, June 21-25, 1999
ERKOV V G; DEVYATOVA S F; MOLODSTOVA E L; MALSTEVA T V; YANOVSKII U A
KANSKI Janusz, ed; NILSSON Per-Olof, ed
Institute of Semiconductor Physics, Siberian Branch, 630090 Novosibirsk, Russia
Chalmers University of Technology and Goeteborg University, Goeteborg, Sweden
ICFSI International Conference on the Formation of Semiconductor Interfaces, 7 (Goeteborg SWE) 1999-06-21
Journal: Applied surface science, 2000, 166 51-56
ISSN: 0169-4332 Availability: INIST-16002; 354000092094700090
No. of Refs.: 16 ref.
Document Type: P (Serial); C (Conference Proceedings) ; A (Analytic)
Country of Publication: Netherlands
Language: English
Titanium dioxide layers were obtained by the low-pressure chemical vapour deposition (**LPCVD**) method from a TiCl SUB 4 , H SUB 2 and N SUB 2 O mixture at 630 Degree C and had rutile modification. The dielectric constant of the titanium dioxide is high, approximately 110, and the breakdown electric field strength more than I MV/cm. The fixed charge for the Si-TiO SUB 2 structures is negative and has a value in the order of 5 X 10 SUP - SUP 8 C cm SUP - SUP 2 and the **interface state** density of these structures is 6 X 10 SUP 1 SUP 0 eV SUP - SUP 1 cm SUP - SUP 2 , After **annealing** in **oxidizing** ambient, the dielectric constant is found to fall off, and the **interface** density of **states** of the Si-TiO SUB 2 structures is increased. It is proposed that this is connected with the Si-TiO SUB 2 interface evolution by the formation of a superthin **silicon dioxide** layer.

English Descriptors: Experimental study; Solid-solid interfaces; Annealing;

Silicon; Titanium oxi[redacted]; **CVD ; Interface states ; CV** racteristic; Semiconductor materials
Broad Descriptors: Transition element compounds; Inorganic compounds; Metal transition compose; Compose mineral

French Descriptors: Etude experimentale; Interface solide solide; Recuit; Silicium; Titane oxyde; Depot chimique phase vapeur; Etat interface; Caracteristique capacite tension; Materiau semiconducteur; Si; O Ti; TiO2 ; 7340Q

Classification Codes: 001B70C40Q

3/19/15 (Item 2 from file: 144)
DIALOG(R)File 144:Pascal

14300701 PASCAL No.: 99-0507498
Photoluminescence from hydrogenated amorphous silicon oxide **thin films**
Amorphous and crystalline insulating thin films II
ZHU M; HAN Y; GODET C; WEHRSPOHN R B
WILSON I H, ed; DEVINE R A B, ed
Department of Physics, Graduate School, University of Science and Technology of China, P.O. Box 3908, Beijing 100039, China; National Laboratory for Super lattices and Microstructures, Beijing 100083, China; Laboratoire de Physique des Interfaces et des Couches Minces, Ecole Polytechnique, 91128 Palaiseau, France; Laboratoire de Physique de la Matiere Condensee, CNRS-Ecole Polytechnique, 91128 Palaiseau, France
Department of Electronic Engineering, The Chinese University of Hong Kong , Hong Kong, China; France Telecom, CNET, Meylan, France
International Conference on Amorphous and Crystalline Insulating Thin Films, 2 (Hong Kong CHN) 1998-10-12
Journal: Journal of non-crystalline solids, 1999, 254 74-79
ISSN: 0022-3093 CODEN: JNCSBJ Availability: INIST-14572; 354000089229820090
No. of Refs.: 21 ref.
Document Type: P (Serial); C (Conference Proceedings) ; A (Analytic)
Country of Publication: Netherlands
Language: English
The photoluminescence (PL) properties of amorphous **silicon oxide** with different oxygen content prepared by dual-plasma chemical vapor deposition have been studied. The PL bands in the energy range of 1.7 to 3.2 eV were observed. The visible light emission from a-SiO SUB x :H is sensitive to the oxygen content. The 3.2 and 2.58 eV PL bands are independent of x. The 2.58 eV PL band is attributed to interfacial defects states. The 3.2 eV PL band is attributed to the oxygen excess defects.

English Descriptors: Experimental study; Thin films; Photoluminescence; Amorphous hydrogenated material; Film growth; **CVD** ; Silicon oxides; **Oxygen** content; Defect **states ; Interface states ; Annealing**
Broad Descriptors: Inorganic compounds; Compose mineral

French Descriptors: Etude experimentale; Couche mince; Photoluminescence; Materiau amorphe hydrogene; Croissance film; Depot chimique phase vapeur; Silicium oxyde; Teneur oxygene; Etat defaut; Etat interface; Recuit; a-SiOx:H; O Si; 7855A; 7866J; 7155J

Classification Codes: 001B70H55A; 001B70H66J; 001B70A55J

3/19/16 (Item 1 from file: 347)
DIALOG(R)File 347:JAPIO

05393493 **Image available**

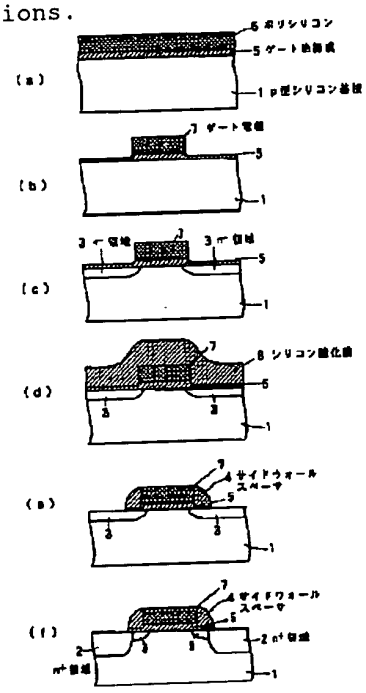
MANUFACTURE OF MOS FIELD-EFFECT TRANSISTOR

PUB. NO.: 09-008293 [JP 9008293 A]
PUBLISHED: January 10, 1997 (19970110)
INVENTOR(s): YAMAMOTO KAZUHIRO
APPLICANT(s): SUMITOMO METAL IND LTD [000211] (A Japanese Company or Corporation), JP (Japan)
APPL. NO.: 07-154571 [JP 95154571]
FILED: June 21, 1995 (19950621)
INTL CLASS: [6] H01L-029/78; H01L-021/336; H01L-021/324
JAPIO CLASS: 42.2 (ELECTRONICS -- Solid State Components)
JAPIO KEYWORD: R097 (ELECTRONIC MATERIALS -- Metal Oxide Semiconductors, MOS); R100 (ELECTRONIC MATERIALS -- Ion Implantation)

ABSTRACT

PURPOSE: To suppress the implantation of electrons by a hot carrier effect and to extend the deteriorating life of mutual conductance by forming an oxide film for forming a sidewall spacer by a **CVD** method, and then **annealing** the oxide film of the spacer in an **oxygen** atmosphere.

CONSTITUTION: A gate insulating film 5 and a polysilicon 6 are deposited on a p-type silicon substrate 1, and with the oxide film as a mask the polysilicon 6 is etched to form a gate electrode 7. Then, with the electrode 7 as a mask phosphorus is ion implanted to form an n(sup -)type region 3 of a low concentration impurity region. Thereafter, a **silicon oxide** film 8 is deposited by an HTO-**CVD** , and to reduce the electron **trap** in the **silicon oxide** film, it is **annealed** in an **oxygen** atmosphere. Then, the film 8 is dry etched to form a sidewall spacer 4 at the side of the electrode 7, arsenic is implanted to form n(sup +) type regions of a high concentration impurity region on source and drain regions.



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            $15.75  7 Types
    $17.51  Estimated cost File2
            $0.80    0.125 DialUnits File8
               $6.60  3 Type(s) in Format  9
            $6.60  3 Types
     $7.40  Estimated cost File8
            $2.57    0.179 DialUnits File34
              $12.60  3 Type(s) in Format  9
            $12.60  3 Types
    $15.17  Estimated cost File34
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               $3.10  2 Type(s) in Format  9
            $3.10  2 Types
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               $1.75  1 Type(s) in Format 19
            $1.75  1 Types
    $16.40  Estimated cost File347
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     $0.50  TYMNET
    $63.62  Estimated cost this search
    $74.89  Estimated total session cost  11.635 DialUnits
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raethoxy(w)silane or alkoxysilane)(15n)(gate(w2)(oxide or dielectric or insulator or in
sulating or isolating or isolator))
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>>>    started at PD=18019 stopped at PD=19831107
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           16564  TETRA
              85  ETHOXYSILANE
              21  TETRA(W)ETHOXYSILANE
             867  TETRAETHOXY
           38765  SILANE
             129  TETRAETHOXY(W)SILANE
             449  ALKOXYSILANE
          165651  GATE
          649005  OXIDE
          340320  DIELECTRIC
          104076  INSULATOR
          118141  INSULATING
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            8627  ISOLATOR
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 2/9/1     (Item 1 from file: 2)
DIALOG(R)File   2:INSPEC
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4596086   INSPEC Abstract Number: B9403-2560R-052
  Title: High quality MOSFETs with N/sub 2/O annealed thin TEOS gate
 oxide
  Author(s): Sun, S.C.; Chang, H.Y.; Chao, T.S.; Lu, C.Y.; Chang, S.W.;
Lee, K.Y.; Lee, L.S.
  Author Affiliation: Nat. Nano Device Lab., Chiao Tung Univ., Hsinchu,
Taiwan
```

Conference Title: 1993 International Symposium on VLSI Technology, Systems, and Applications. Proceedings of Technical Papers (Cat. No.93TH0524-9) p.109-11
Publisher: IEEE, New York, NY, USA
Publication Date: 1993 Country of Publication: USA xi+386 pp.
ISBN: 0 7803 0978 2
Conference Sponsor: IEEE; Nat. Sci. Council ROC; Ind. Technol. Res. Inst. ; MOEA, ROC; Chinese Inst. Electr. Eng.; et al
Conference Date: 12-14 May 1993 Conference Location: Taipei, Taiwan
Language: English Document Type: Conference Paper (PA)
Treatment: Practical (P); Experimental (X)
Abstract: The authors present the electrical characteristics of MOSFETs utilizing thin (125 AA) TEOS deposited gate oxides. Results show that devices of TEOS oxide with N/sub 2/O anneal have smaller initial drain current degradation under CHC stress condition. The transconduction degradation is slightly worse as compared to thermal gate oxide devices. (6 Refs)
Subfile: B
Descriptors: annealing; CMOS integrated circuits; insulated gate field effect transistors; nitridation; VLSI
Identifiers: CMOS; submicron device fabrication; LOCOS isolation; VLSI; tetraethoxysilane; hot carrier stress; high quality gate oxide; thin **TEOS gate oxide** ; electrical characteristics; MOSFET; drain current degradation; transconduction degradation; N/sub 2/O anneal
Class Codes: B2560R (Insulated gate field effect transistors); B2550E (Surface treatment); B2570D (CMOS integrated circuits)
Chemical Indexing:
N2O bin - N2 bin - N bin - O bin (Elements - 2)

2/9/2 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

04359109 INSPEC Abstract Number: B9304-2560R-038
Title: Enhanced hot-carrier degradation due to water in TEOS/O/sub 3/-oxide and water blocking effect of ECR-SiO/sub 2/
Author(s): Shimoyama, N.; Machida, K.; Murase, K.; Tsuchiya, T.
Author Affiliation: NTT LSI Lab., Kanagawa, Japan
Conference Title: 1992 Symposium on VLSI Technology. Digest of Technical Papers (Cat. No.92CH3172-4) p.94-5
Publisher: IEEE, New York, NY, USA
Publication Date: 1992 Country of Publication: USA x+120 pp.
ISBN: 0 7803 0698 8
U.S. Copyright Clearance Center Code: 92CH3172-4/92/0000-0094$03.00
Conference Sponsor: IEEE; Japan Soc. Appl. Phys
Conference Date: 2-4 June 1992 Conference Location: Seattle, WA, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Experimental (X)
Abstract: The effect of water and/or silanols in TEOS/O/sub 3/-oxide on hot-carrier degradation is discussed. Hot-carrier degradation in MOSFETs is a serious problem as the thickness of the TEOS/O/sub 3/-oxide interlayer dielectric increases. This results mainly from enhanced hot-electron trapping and also from interface-trap generation, which are related to water and/or silanols in **TEOS** /O/sub 3/-oxide diffusing into the **gate oxide** . It is pointed out that by applying an ECR (electron cyclotron resonance) SiO/sub 2/ layer under the TEOS/O/sub 3/-oxide layer, tolerance against hot-carrier damage is improved to the level of MOSFETs without the TEOS/O/sub 3/-oxide layer. (5 Refs)
Subfile: B
Descriptors: dielectric thin films; hot carriers; insulated gate field effect transistors; interface electron states; oxidation; semiconductor device testing; water
Identifiers: ECR layer; hot-carrier degradation; water blocking effect; silanols; MOSFETs; interlayer dielectric; enhanced hot-electron trapping; interface-trap generation; TEOS/O/sub 3/-oxide layer; Si-SiO/sub 2/
Class Codes: B2560R (Insulated gate field effect transistors); B2550E (

Surface treatment)
Chemical Indexing:
Si-SiO2 int - SiO2 int - O2 int - Si int - O int - SiO2 bin - O2 bin - Si bin - O bin - Si el (Elements - 1,2,2)

2/9/3 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC

04291950 INSPEC Abstract Number: B9301-2560R-027
Title: Impact of inter-metal-oxide deposition condition on NMOS and PMOS transistor hot carrier effect
Author(s): Jiang, C.; Hu, C.; Chen, C.H.; Tseng, P.N.
Author Affiliation: VLSI Technology Inc., San Jose, CA, USA
Conference Title: 30th Annual Proceedings. Reliability Physics 1992 (Cat. No.92CH3084-1) p.122-6
Publisher: IEEE, New York, NY, USA
Publication Date: 1992 Country of Publication: USA x+404 pp.
ISBN: 0 7803 0473 X
U.S. Copyright Clearance Center Code: CH3084-1/92/0000-0122$01.00
Conference Sponsor: IEEE
Conference Date: 31 March-2 April 1992 Conference Location: San Diego, CA, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Experimental (X)
Abstract: The hot carrier effect of NMOSFETs and PMOSFETs has been investigated for different inter-metal-oxide (IMO) deposition conditions. It was found that the hot carrier effect lifetime of NMOSFETs using silane-based oxide deposition can be more than two orders of magnitude longer than that of NMOSFETs using tetraethylorthosilicate (TEOS) based deposition, while PMOSFETs exhibit more net electron trapping. TEOS IMO apparently increases the rate of hole trapping and hold-induced generation of bulk and interface traps. A Si-rich oxide deposition condition improves the hot carrier lifetime, but does not overcome the deleterious effect of an additional **TEOS** oxide layer. IMO only influences the charge trapping properties of **gate oxide** interface in the vicinity of the source-drain gate edges and therefore affects short channel devices more strongly. (12 Refs)
Subfile: B
Descriptors: carrier lifetime; CVD coatings; electron traps; hole traps; hot carriers; insulated gate field effect transistors; interface electron states; semiconductor device testing
Identifiers: inter-metal-oxide deposition condition; NMOSFETs; PMOSFETs; silane-based oxide deposition; tetraethylorthosilicate; electron trapping; hole trapping; interface traps; hot carrier lifetime; charge trapping properties; gate oxide interface; source-drain gate edges; short channel devices
Class Codes: B2560R (Insulated gate field effect transistors); B0520F (Vapour deposition)

2/9/4 (Item 4 from file: 2)
DIALOG(R)File 2:INSPEC

03453749 INSPEC Abstract Number: B89061672
Title: Study of n-channel enhancement mode InP MISFETs
Author(s): Jiang Ruolian; Zheng Youdou; Wang Renkang
Author Affiliation: Dept. of Phys. Nanjing Univ., China
Journal: Chinese Journal of Semiconductors vol.9, no.5 p.451-8
Publication Date: Sept. 1988 Country of Publication: China
CODEN: PTTPDZ ISSN: 0253-4177
Language: Chinese Document Type: Journal Paper (JP)
Treatment: Experimental (X)
Abstract: n-channel enhancement mode InP MISFETs based on the InP/SiO/sub 2/ interface are fabricated on Fe-doped S.I. InP (100) orientated with

TEOS -PECVD SiO/sub 2/ as the **gate oxide** . Source-drain regions are implanted with Si/sup +/ to create n/sup +/ layers. The effective electron channel mobility and transconductance are 1400 cm/sup 2//V.S and 6.4 ms/mm respectively. The characteristics of the MISFETs and long-term drain current drift of the MISFETs are discussed. (9 Refs)

Subfile: B

Descriptors: carrier mobility; III-V semiconductors; indium compounds; insulated gate field effect transistors; plasma CVD coatings

Identifiers: metal-insulator-semiconductor field effect transistor; n-channel enhancement mode InP MISFETs; gate oxide; n/sup +/ layers; effective electron channel mobility; transconductance; long-term drain current drift; InP-SiO/sub 2/; InP:Fe; InP:Fe,Si/sup +/

Class Codes: B2560R (Insulated gate field effect transistors)

Chemical Indexing:

InP-SiO2 int - SiO2 int - InP int - In int - O2 int - Si int - O int - P int - SiO2 bin - InP bin - In bin - O2 bin - Si bin - O bin - P bin (Elements - 2,2,4)

InP:Fe sur - InP sur - Fe sur - In sur - P sur - InP:Fe ss - Fe ss - In ss - P ss - InP bin - In bin - P bin - Fe el - Fe dop (Elements - 2,1,3)

InP:Fe,Si int - InP int - Fe int - In int - Si int - P int - InP:Fe,Si ss - Fe ss - In ss - Si ss - P ss - InP bin - In bin - P bin - Fe el - Si el - Fe dop - Si dop (Elements - 2,1,1,4)

2/9/5 (Item 1 from file: 8)

03737078 E.I. No: EIP93101095206

Title: Enhanced hot-carrier degradation due to water-related components in TEOS/O//3 oxide and water blocking with ECR-SiO//2 film

Author: Shimoyama, Nobuhiro; Machida, Katsuyuki; Takahashi, Jun-ichi; Murase, Katsumi; Minegishi, Kazushige; Tsuchiya, Toshiaki

Corporate Source: NTT LSI Lab, Kanagawa, Jpn

Source: IEEE Transactions on Electron Devices v 40 n 9 Sep 1993. p 1682-1687

Publication Year: 1993

CODEN: IETDAI ISSN: 0018-9383

Language: English

Document Type: JA; (Journal Article) Treatment: X; (Experimental); T; (Theoretical)

Journal Announcement: 9312W4

Abstract: A TEOS/O//3-oxide layer used as an interlevel dielectric enhances hot-carrier degradation of MOSFET's due to the water-related components (water and/or silanols) contained in the layer. This results mainly from enhanced hot-electron trapping in the **gate oxide** and also from interface-trap generation. By applying an ECR-SiO//2 layer under the **TEOS** /O//3-oxide layer, tolerance against hot-carrier damage is improved to the level of MOSFET's without the TEOS/O//3 oxide. From ESR measurement results, it is found that the spin density of the ECR-SiO//2 film under the TEOS/O//3 oxide was two orders lower than that of the ECR-SiO//2 film only. It is speculated that the dangling bonds in the ECR-SiO//2 film effectively trap water diffusing from the water-containing overlayer. (Author abstract) 18 Refs.

Descriptors: *MOSFET devices; Hot carriers; Semiconducting silicon compounds; Oxides; Ozone

Identifiers: Enhanced hot carrier degradation; Water-related components; Interval dielectric; Hot electron trapping; ESR measurements; Tetra-ethoxysilane; Spin density; Dangling bonds

Classification Codes:

712.1.2 (Compound Semiconducting Materials)

714.2 (Semiconductor Devices & Integrated Circuits); 712.1 (Semiconducting Materials)

714 (Electronic Components); 712 (Electronic & Thermionic Materials); 804 (Chemical Products)

71 (ELECTRONICS & COMMUNICATIONS); 80 (CHEMICAL ENGINEERING)

2/9/6 (Item 1 from file: 65)
DIALOG(R)File 65:Inside Conferences

00294599 INSIDE CONFERENCE ITEM ID: CN002752918
High Quality MOSFET's with N~2O Annealed Thin TEOS Gate Oxide
Sun, S. C.; Chang, H. Y.; Chao, T. S.; Lu, C. Y.
CONFERENCE: VLSI technology, systems, and applications-International symposium
INTERNATIONAL SYMPOSIUM ON VLSI TECHNOLOGY SYSTEMS AND APPLICATIONS, 1993; ISSUE 6 P: 109-111
IEEE, **1993**
ISSN: NONE-0293 ISBN: 0780309782; 0780309790
LANGUAGE: English DOCUMENT TYPE: Conference Papers
CONFERENCE SPONSOR: National Science Council
Industrial Technology Research Institute
Institute of Electrical and Electronics Engineers
CONFERENCE LOCATION: Taipei
CONFERENCE DATE: May 1993 (199305) (199305)

BRITISH LIBRARY ITEM LOCATION: 4550.370600
NOTE:
IEEE Cat no 93TH0524-9
DESCRIPTORS: IEEE; VLSI technology; VLSI systems; VLSI applications

2/9/4 (Item 4 from file: 2)
DIALOG(R)File 2:INSPEC

03453749 INSPEC Abstract Number: B89061672

Title: Study of n-channel enhancement mode InP MISFETs

Author(s): Jiang Ruolian; Zheng Youdou; Wang Renkang
Author Affiliation: Dept. of Phys. Nanjing Univ., China

Journal: Chinese Journal of Semiconductors vol.9, no.5 p.451-8
Publication Date: Sept. 1988 Country of Publication: China
CODEN: PTTPDZ ISSN: 0253-4177
Language: Chinese Document Type: Journal Paper (JP)
Treatment: Experimental (X)

Abstract: n-channel enhancement mode InP MISFETs based on the InP/SiO/sub 2/ interface are fabricated on Fe-doped S.I. InP (100) orientated with **TEOS** -PECVD SiO/sub 2/ as the **gate oxide** . Source-drain regions are implanted with Si/sup +/ to create n/sup +/ layers. The effective electron channel mobility and transconductance are 1400 cm/sup 2//V.S and 6.4 ms/mm respectively. The characteristics of the MISFETs and long-term drain current drift of the MISFETs are discussed. (9 Refs)

Subfile: B
Descriptors: carrier mobility; III-V semiconductors; indium compounds; insulated gate field effect transistors; plasma CVD coatings
Identifiers: metal-insulator-semiconductor field effect transistor; n-channel enhancement mode InP MISFETs; gate oxide; n/sup +/ layers; effective electron channel mobility; transconductance; long-term drain current drift; InP-SiO/sub 2/; InP:Fe; InP:Fe,Si/sup +/
Class Codes: B2560R (Insulated gate field effect transistors)
Chemical Indexing:
InP-SiO2 int - SiO2 int - InP int - In int - O2 int - Si int - O int - P int - SiO2 bin - InP bin - In bin - O2 bin - Si bin - O bin - P bin (Elements - 2,2,4)
InP:Fe sur - InP sur - Fe sur - In sur - P sur - InP:Fe ss - Fe ss - In ss - P ss - InP bin - In bin - P bin - Fe el - Fe dop (Elements - 2,1,3)
InP:Fe,Si int - InP int - Fe int - In int - Si int - P int - InP:Fe,Si ss - Fe ss - In ss - Si ss - P ss - InP bin - In bin - P bin - Fe el - Si el - Fe dop - Si dop (Elements - 2,1,1,4)